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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/604,555	07/30/2003	Jean Audet	CA920030012US1	1554
32074	7590	02/15/2005	EXAMINER	
INTERNATIONAL BUSINESS MACHINES CORPORATION				HYEON, HAE M
DEPT. 18G				
BLDG. 300-482				
2070 ROUTE 52				
HOPEWELL JUNCTION, NY 12533				
				ART UNIT 2839
				PAPER NUMBER
				DATE MAILED: 02/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	10/604,555	AUDET ET AL.
	Examiner Hae M. Hyeon	Art Unit 2839

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 30 July 2003.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-24 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 30 July 2003 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | Paper No(s)/Mail Date. _____ .  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>3/1/04</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|   | 6) <input type="checkbox"/> Other: _____.                                   |

## **DETAILED ACTION**

### *Specification*

1. The disclosure is objected to because of the following informalities:
  - Paragraph [0032], line 2 recites, “flat pad (12), but paragraph [0033], line 11 recites, “pad 12” and paragraph [0035], line 10 recites, “contact surfaces (12).” The terminology for the same element should be consistent through out the present specification.
  - The examiner suggests the applicant to change “figure 2” in the paragraph [0036], lines 2 and 4 to -- Figure 2 --.
  - The examiner suggests the applicant to change “figure 3” in the paragraph [0037], line 2 to -- Figure 3 --.
  - In the paragraphs [0032], line 1; [0033], line 11; [0040], line 5; [0041], line 3; [0043], line 10; [0047], lines 4 and 14; [0048], line 6; and [0051], line 9, reference numbers are not in parenthesis.

Appropriate correction is required.

### *Claim Objections*

2. Claims 1-24 are objected to because of the following informalities:
  - Claim 1, line 1 “[c1]” should be -- 1. --. Claims 2-24 should also be changed accordingly.
  - Claims 1, 13, and 19, the full terminology for the first abbreviation “I/O” is required.

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 5, 6, 13, 14, 19 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Distefano et al (6,007,349).

Distefano discloses an assembly of an integrated circuit (IC) package comprising a plurality of input/output (I/O) pads (not shown) on a surface of the IC package, a plurality of contact pads (not shown) on a substrate 50, and a plurality of electrically conductive connectors. Each of the connectors comprises a first contact surface 20, a second contact surface 30, and a flexible portion 10 interconnecting the first and second contact surfaces 20 and 30. The first contact surface 20 of the connectors is joined to an I/O pad of the IC package and the second contact surface of the connectors is joined to a contact pad on the substrate 50 by solder (see Figs. 6 and 7A). Each of the flexible portions is comprised of at least two parallel and flexible conductors, wherein the conductors are electrically insulated from each other for a portion of their lengths. Although Distefano does not state the distance between the at least two conductors to be at least 10 percent of the length of the portion of the length of the conductors which are insulated from each other, Figure 1 and 6 clearly shows this structure.

5. Claims 1-6, 13, and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Guerin et al (6,532,654 B2).

Guerin discloses an assembly of an integrated circuit (IC) package comprising a plurality of input/output (I/O) pads 34 on a surface of the IC package 32, a plurality of contact pads 26 on a substrate 22, and a plurality of electrically conductive connectors 12. Each of the connectors 12 comprises a first contact surface 16, a second contact surface 14 with a tab 18, and a flexible portion interconnecting the first and second contact surfaces 16 and 14. The first contact surface 16 of the connectors 12 is joined to an I/O pad 34 of the IC package 32 and the second contact surface 14 of the connectors 12 is joined to a contact pad 26 on the substrate 22 by solder. Each of the flexible portions is comprised of at least two parallel, angled and flexible conductors, wherein the conductors are electrically insulated from each other for a portion of their lengths.

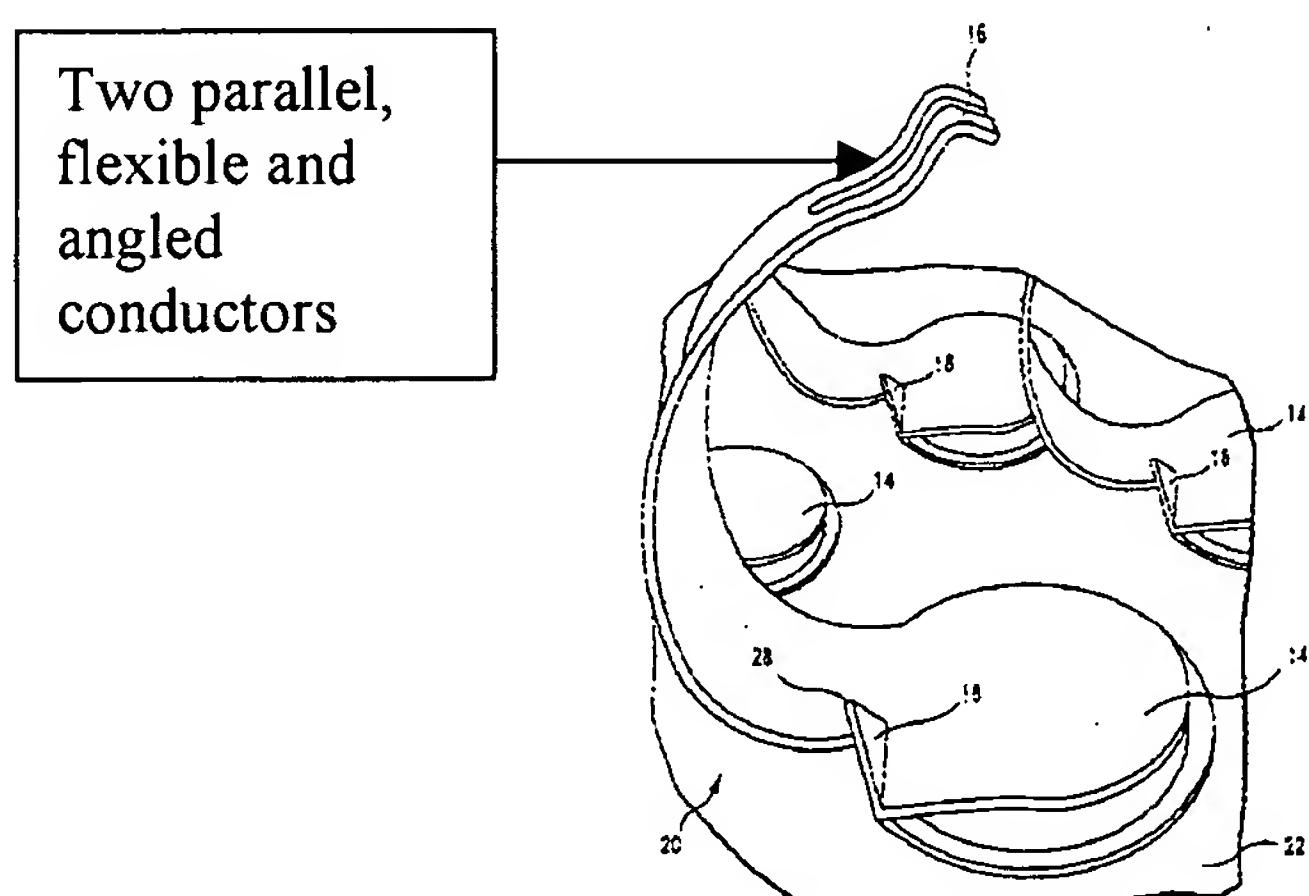


FIG. 4

#### *Claim Rejections - 35 USC § 103*

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 7-12, 14-18 and 20-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guerin et al (6,532,654 B2) in view of Distefano et al (6,007,349).

Claims 7-12, 14-18 and 20-24 recite various limitations such as:

- Connectors being arranged and oriented on the surface of IC package around the geometric center of the IC package,
- The distance between the at least two parallel conductors being corresponding to at least 10 percent of the length of the portion of the length of the conductors which are insulated from each other,
- Each connector having a tab portion extending from the first contact surface and generally coplanar with the first contact surface,
- Each connector being made of a flat, metallic, and electrically conductive material and being coated with a different metal,
- The flexible portion being parallel and perpendicular to the first and second contact surface, and having extremities that are joined together to form the first and second contact surfaces.

While Guerin discloses the connector being made of a flat, metallic, and electrically conductive material, and having a tab 18, Guerin does not disclose other limitations.

Distefano discloses a connector used in an IC package (chip) comprising at least two flexible portions 10 parallel to each other and has extremities that are joined together to form first and second contact surfaces 20 and 30 wherein the at least two flexible portions 10 are

perpendicular to the first and second surface 20 and 30 and the distance between the at least two parallel conductors being corresponding to at least 10 percent of the length of the portion of the length of the conductors which are insulated from each other. Distefano teaches that the connector having flexible vertical portions allows the connector to accommodate deflection in the lateral directions induced by coefficient of thermal expansion mismatches between the IC package and the substrate 50 during thermal cycling of the IC Package.

Regarding to the orientation of the connector, it only deals with rearrangement of part to arrange the connector 12 of Guerin to orient on the surface of IC package around the geometric center of the IC package. It has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

Regarding to the connector being coated with different metal, it is common knowledge to coat a connector with a metal such as gold to provide good electric conductivity and to prevent corrosion.

Regarding to a tab coplanar with the first surface, Guerin discloses a tab 18, but the tab 18 is perpendicular to the contact surface 14. However, extending the tab 18 coplanar with the contact surface 14 dose not affect or change the function of the connector 12 of Guerin. Furthermore, the instant invention does not provide any reason or a specific problem to be solved by having a tab portion coplanar with the contact surface.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the flexible portion taught by Guerin such that it would have extremities that are joined together to form first and second contact surfaces wherein at least two flexible portions are perpendicular to the first and second surfaces as taught by Distefano to

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allow the connector to accommodate deflection in the lateral directions induced by coefficient of thermal expansion mismatches between the IC package and the substrate during thermal cycling of the IC Package.

***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patent No. 6,590,772 B1 by Ju and US Patent No. 6,719,569 B2 by Ochiai.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hae M. Hyeon whose telephone number is 571-272-2093. The examiner can normally be reached on Mon.-Fri. (8:30-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tulsidas C. Patel can be reached on (571) 272-2098. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Hae M Hyeon  
Primary Examiner  
Art Unit 2839

hmh hmh

*Hae Moon Hyeon*